NASA Procedural Requirements

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Appendix F. Tailoring

F.1 Tailoring is the documentation and approval of the adaptation of the processes and approach to complying with requirements according to the purpose, complexity, and scope of a NASA program or project. Tailoring, including rationale for modifications, additions, or deletions should be approved by the DGA.

F.2 Each project following this SE NPR needs to tailor to the specific needs of a particular project, phase, or acquisition structure. Tasks that add unnecessary costs or data and any factors that do not add value to the project should be eliminated. Tailoring takes the form of modification or addition.

F.3 Tailoring specific tasks requires definition of the depth of detail, level of effort, and the data expected. Tailoring is performed to both breadth and depth based on the project and specific phase of the life cycle. "Tailoring in breadth" deals with factors that can include types and numbers of systems impacted by the development of a new subsystem, the numbers and types of assessments, and numbers and types of reviews. "Tailoring in depth" involves decisions concerning the level of detail needed to generate and substantiate the requirements. The depth of the SE effort varies from project to project in relation to complexity, uncertainty, urgency, and the willingness to accept risk.

F.4 The objectives of the effort, the scope of the SE process, and the breadth and depth of application need to be considered. To assist in defining the depth of application and level of effort, the following should be evaluated as part of the tailoring process of this SE NPR:

a. The level of detail in system definition required from the in-house Government or contracted effort.

b. The directions and limitations of tasks including willingness to accept risk.

c. The scenarios and missions to be examined for each primary system function.

d. A set of measures of effectiveness.

e. Known constraints in areas where they exist but quantitative data is not available.

f. The technology database including identification of key technologies, performance, maturity, cost, risks, schedule, and any limiting criteria on the use of technologies.

g. The factors essential to system success, including those factors related to major risk areas (e.g., budget, resources, and schedule).

h. Technical demonstration and confirmation events that need to be conducted (including technical reviews).

i. The goals and constraints of the project.

j. The organizational and contractual requirements for SE processes.

k. The baseline SE process for the organization and tailoring guidelines.

l. Any cost targets and the acceptable level of risk.

F.5 The basic SE tailoring process can be applied to any development effort (including new developments, modifications, and product improvements) regardless of size or complexity. Attention to scope of the effort and level of output expected is essential. A revolutionary new system development, for example, in Formulation will not usually require formal configuration management audits or formal change control mechanisms. However, conceptual exploration investigation of modifications to an existing developed system may need this type of activity.

F.6 The level of detail expected from the system products of the technical effort needs to be identified. This will determine the depth to which the SE process is executed. For example, functional analysis and synthesis are conducted to a sufficiently detailed depth to identify areas of technical risk based on the life-cycle phase or effort.

F.7 The term "sufficiently detailed" is determined based on the objectives of the project and can be characterized by the information content expected from the physical architecture. Throughout the life cycle, the level of detail may vary since the baseline system may be at one level of detail and product improvements or other modifications may be at a different level of detail. Note that level of detail needed from the technical effort to ensure adequacy of technical definition, design, and development is not synonymous with the level of detail expected for management control and reporting (e.g., cost performance reports).

F.8 The primary output of the SE tailoring process for a project is documented in the SEMP. The form of the SEMP will vary depending on the size, complexity and acceptable cost or risk level of the project.

References

The following documents were used as reference materials in the development of this appendix:

a. Defense Acquisition University Systems Engineering Fundamentals. Ft. Belvoir, Virginia: Defense Acquisition University Press, December 2000.

b. International Council on Systems Engineering (INCOSE) Systems Engineering Guide.

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